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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,974	02/28/2005	Takashi Ogura	033723-009	3181

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EXAMINER

MARTIN, PAUL C

ART UNIT PAPER NUMBER

1657

DATE MAILED: 10/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/525,974	OGURA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Paul C. Martin	1657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date: _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/27/06</u>   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

Claims 1-4 are pending in this application and were examined on their merits.

The Claim objection to Claim 1 has been withdrawn due to the Applicant's amendment to the claims filed 07/27/06.

The rejection of Claim 1 under 35 U.S.C. § 112, First Paragraph has been withdrawn due to the Applicants amendment.

The rejection of Claims 1-4 under 35 U.S.C. § 112, Second Paragraph has been withdrawn due to the Applicant's amendment.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-4 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Geren *et al.* (1995) in view of Schlichting *et al.* (2000).

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This rejection is maintained for reasons of record set forth in the paper mailed 02/27/06.

Applicant's arguments filed 07/27/06 have been fully considered but they are not deemed to be persuasive.

### ***Response to Arguments***

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The Applicant argues that Geren *et al.* is directed to solving a problem using a different method than the problem and method used by Schlichting or taught in the instant application such that there is no motivation to combine. The Applicant details the specific experimental differences such as the reduction rates and the orientation of the Ruthenium complexes of Geren *et al.* vs. the instant application (Remarks, Pg. 8, Lines 13-25).

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The Applicant's arguments are not found to be persuasive for the following reasons, the instant application is directed to a method for trapping reaction intermediates of an oxidoreductase comprising the admixture of an oxidoreductase, a photoinduced reducing agent, an amine type electron donor and substrate followed by freezing of the mixture and irradiation by light to initiate the reaction. Geren *et al.* teaches dissolving the oxidoreductase cytochrome-c oxidase, the photoinduced reducing agent Ruthenium (bipyridine), the substrate heme c and the amine-type donor aniline in buffer (Pg. 2467, Column 2, Lines 24-29); and irradiating the mixture with a light in a wavelength region including the absorbing wavelength of the photoinduced reducing agent in order to induce a reaction. Schlichting *et al.* teaches a method of trapping reaction intermediates of an oxidoreductase comprising Schlichting *et al.* teaches a method comprising dissolving the oxidoreductase, substrate, and electron donors in a first step, a second step of freezing the reaction mixture at 88K, irradiating the frozen mixture with x-ray light at 96K in a third step, and raising the temperature of the frozen mixture to 100K in the third step (Pg. 1616, Table 1). Motivation to combine the references is provided in the prior Office action wherein Geren *et al.* when combined with Schlichting *et al.*, would enable the ordinary artisan to "trap" and examine the volatile intermediate structures of oxidoreductase. The fact that Geren *et al.* varies from the instant application in details such as reduction rates and the orientation of the Ruthenium complexes is not relevant to the claims at hand which mention neither.

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Applicant argues that Geren *et al.* does not teach the mixing of compounds in water but only in a buffer at a certain pH, as opposed to the instant application that teaches water as the solvent and no pH. Applicant further argues that Geren *et al.* does not teach the steps of lowering and raising the temperature or the freezing of the reaction (Remarks, Pg. 8, Lines 32 and Pg. 9, Lines 1-2).

Geren *et al.* teaches the dissolution of the reaction components in a sodium phosphate buffer (Pg. 2467, Column 2, Lines 4-5). As sodium phosphate is commercially available generally in powder form, one of skill in the art would have recognized that sodium phosphate is readily dissolvable in water and sodium phosphate buffer is generally prepared with water as the solvent. The fact that Geren *et al.* does not teach a temperature the steps of lowering and raising the temperature or the freezing of the reaction was acknowledged in the prior Office action and was addressed by the combination with Schlichting *et al.*

Applicant argues that Schlichting *et al.* uses a reducing agent requiring added oxygen and x-ray irradiation; as opposed to the instant application which teaches a photoinduced reducing agent requiring no oxygen and no x-rays (Remarks, Pg. 9, Lines 8-14).

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Applicant's arguments are not found persuasive because a certain amount of variation such as the presence or absence of oxygen, between a reference and a claimed invention is to be expected. The fact that X-ray irradiation was used does not negate the fact that X-rays are a form of light radiation and provide the same reduction step in either case.

Applicant argues that Schlichting *et al.* does not teach adding an amine type electron donor, does not teach the use of water, teaches raising the temperature above the claimed amount of 270 degrees K and teaches observation of a color change. Applicant argues that these differences negate a motivation to combine the references and provide no expectation of success in doing so (Remarks, Pg. 9, Lines 15-20 and Pg. 10, Lines 1-16).

As stated above, a certain amount of variation between the references and the instant application is to be expected. Schlichting *et al.* teaches a method of trapping reaction intermediates of an oxidoreductase comprising Schlichting *et al.* teaches a method comprising dissolving the oxidoreductase, substrate, and electron donors in a first step, a second step of freezing the reaction mixture at 88K, irradiating the frozen mixture with x-ray light at 96K in a third step, and raising the temperature of the frozen mixture to 100K in the third step.

Geren *et al.* teaches dissolving the oxidoreductase cytochrome-c oxidase, the photoinduced reducing agent Ruthenium (bipyridine), the substrate heme c and the amine-type donor aniline in buffer; and irradiating the mixture with a light in a wavelength region including the absorbing wavelength of the photoinduced reducing agent in order to induce a reaction. Motivation to combine the method of Geren *et al.* with that of Schlichting *et al.* is apparent because the method of Geren only provides for the very rapid reaction of oxidoreductase on a substrate through photoreduction of a reducing agent, with amine electron donors. The method does not provide any insight as to the short-lived intermediates and is performed at physiological temperatures. When combined with Schlichting, the methods enable the ordinary artisan to "trap" and examine the volatile intermediate structures of oxidoreductase by initiating the reaction and maintaining it at a very slow pace. A reasonable expectation of success would be expected because of the similarities between the two reactions in components, varying in temperature.

Both references would have been available to one of skill in the art at the time of the invention, whom would also have been aware of the individual reaction steps and processes involved in either reference. As the practice of each method was conventionally known in the art, the invention as a whole is *prima facie* obvious over the references, especially in the absence of evidence to the contrary.



***Conclusion***

No Claims are allowed.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul C. Martin whose telephone number is 571-272-3348. The examiner can normally be reached on M-F 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon Weber can be reached on 571-272-0925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Martin  
Examiner  
Art Unit 1657

10/04/06

PATRICIA LEITH  
PRIMARY EXAMINER

A handwritten signature in black ink, appearing to read 'Patricia Leith', written over the printed name and title.